

REMARKS

Claims 1, 3-6, 8-10, 41 and 42 are pending in the application. Claims 1, 3, 4, 6, 8 and 9 have been amended. Claims 11-40 have been canceled without prejudice or disclaimer. Claims 41 and 42 are newly added. Reconsideration of this application is respectfully requested.

The Office Action rejects claims 1 and 3-5 under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 4,528,072 to Kurosawa et al., hereafter Kurosawa.

This rejection is obviated by the amendment to claims 1 and 3. As amended, independent claim 1 recites that the combination of a "carrier and an electrical connector that comprises a hollow body", the hollow body having "a plurality of surface voids so that said electrical connector accommodates forced physical and electrical contact with at least one separate electrical contact". Support for the amendment is in Fig. 1 and page 8, line 28 bridging to page 9, line 9.

Kurosawa does not disclose or teach an electrical connector that has a hollow body with a plurality of voids so that the electrical connector accommodates "forced physical and electrical contact with at least one separate electrical contact". Rather, Kurosawa discloses a multi-layered substrate configuration in which the connectors of adjacent substrates are connected by integrated circuit techniques and not by "forced physical contact". The purpose of the surface voids is to give elasticity for the compression of the forced physical and electrical contact. Kurosawa does not teach an electrical connector that accommodates a "forced physical and electrical contact".

As amended, dependent claim 3 recites that at least two of the surface voids are on the same side of the carrier. Support for this amendment is in Figs. 25-27. Kurosawa does not teach or disclose this feature.

For the reason set forth above, it is submitted that the rejection of claims 1 and 3-5 under 35 U.S.C. 102(b) as anticipated by Kurosawa is obviated by the amendment and should be withdrawn.

The Office Action rejects claim 1 and 3-5 under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 4,181,385 to DeSantis et al., hereafter DeSantis.

This rejection is obviated by the amendments to claims 1 and 3 discussed above.

DeSantis does not disclose or teach an electrical connector that has a hollow body with a plurality of voids so that the electrical connector accommodates "forced physical and electrical contact with at least one separate electrical contact". Rather, DeSantis discloses a low profile socket, which is eyeletted to a printed circuit board to receive pins of a plug-in component. There is no disclosure of an electrical connector that accommodates "forced physical and electrical contact" as claimed. The purpose of the claimed surface voids is to give elasticity for the compression of the forced physical and electrical contact.

In contrast, DeSantis describes a soldered down connector, which is irrelevant to the claimed grid array interposer, which is not hard fixed on either side and is held in place solely by externally applied spring force. DeSantis describes a vent (not a hollow feature) to allow gas build-up during soldering to escape to avoid its interference with soldering. DeSantis does not teach an electrical connector having a hollow body that accommodates a "forced physical and electrical contact".

With respect to claim 4, the Examiner contends that DeSantis discloses a hollow body with at least two voids. However, DeSantis' voids (the gas vents) are side by side on the same side of the circuit board, and not on opposed sides

in registration with one another. DeSantis' vertically oriented voids are one per contact and function only as a gas vent.

For the reason set forth above, it is submitted that the rejection of claims 1 and 3-5 under 35 U.S.C. 102(b) as anticipated by DeSantis is obviated by the amendment and should be withdrawn.

The Office Action rejects claims 6-10 under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 5,562,462 to Matsuba et al., hereafter Matsuba.

Matsuba describes a pin grid array docking scheme. Matsuba refers to hollows, which are hollow cylinders meant to accept a pin-like protrusion. Each cylinder has a funnel shape structure within a can shaped structure, which accepts and guides the pin. There is no hollow body that itself is acting as a contact. Matsuba merely discloses a cavity that once filled with a pin becomes an electrical contact (no longer hollow during electrical use after pin inserted).

Moreover, Matsuba does not disclose or teach that the socket contact is disposed in a via for "forced physical and electrical contact with the connector of said module and the connector of said printed wiring board". Matsuba's socket contact 32 is soldered to the contact pad 34, which is not a "forced physical and electrical contact" as recited in independent claim 6.

With respect to amended dependent claim 8, Matsuba does not teach or disclose a contact button with at least two surface voids disposed on the same side of the carrier.

For the reason set forth above, it is submitted that the rejection of claims 6-10 under 35 U.S.C. 102(b) as anticipated by Matsuba is obviated by the amendment and should be withdrawn.

The Office Action rejects claims 1 and 3-10 under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 5,924,875 to Tighe et al., hereafter Tighe. This rejection is moot as to claims 7, which was previously canceled.

Tighe does not disclose or teach an “electrical contact button that is hollow” and “that is in said via” as recited in independent claim 6. Tighe’s bumps 15 and 17 are two separate pieces, neither of which is disposed in Tighe’s metal cylinder 14. The Examiner reads the claimed electrically conductive via on element 16. The Examiner, when discussing claim 3, contends that the claimed hollow body is disclosed by the combination of Tighe’s bumps 15 and 17 and the metal cylinder 14. Thus, the Examiner reads two separately recited elements, an electrically conductive via and an electrically conductive hollow body, on the same item, the metal cylinder of the reference. This reading is unreasonable and impermissible.

Tighe does not speak of compressibility in an elastic sense. Tighe describes bumps 15 and 17 as being malleable, which is specifically a plastic deformation of the metal. Such a plastic deformation would render the bumps 15 and 17 ineffective as they could not accommodate the expansion and contraction that the claimed compressible elastic contact could. Tighe also only discloses a one dimensional line of connectors, not a two dimensional land grid array. Indeed fabrication of one and two dimensional arrays are different. Tighe’s application is specific to flex connectors for cryogenic temperature to room temperature excursions. The claimed invention is intended for chip module to circuit board connections. The force and registration requirements are entirely different. Perhaps most important, bumps 15 and 17 have no surface voids to ambient, meaning bumps 15 and 17 would explode upon compression, whether plastically (as Tighe describes) or elastically deformed. In order for Tighe’s device not to be a closed system vulnerable to this rupturing, Tighe would need discontinuous pattern fabrication. Applicants describe such discontinuous patterns while Tighe does not.

For the reason set forth above, it is submitted that the rejection of claims 1, 3-6 and 8-10 under 35 U.S.C. 102(b) as anticipated by Tighe is obviated by the amendment and should be withdrawn.

The Office Action rejects claim 6 under 35 U.S.C 103(a) as unpatentable over U.S. Patent No. 4,381,134 to Anselmo et al., hereafter Anselmo, in view of Matsuba.

The Examiner refers to an Attachment 5. However, the Office Action as mailed to Applicants does not contain an Attachment 5. The Examiner contends that Attachment 5 discloses a module 40. However, Anselmo does not disclose a module 40. Therefore, Anselmo lacks the module recited in claim 6.

The Examiner also contends that Anselmo's connector is an electrical contact button. This contention is traversed. First, Anselmo's connector 20 is not a button, but rather is a structure of solid pins of a square cross section being fit, actually press fit, into a plated via. This has nothing to do with a compressible hollow body electrical connector as claimed in claim 6.

Second, the compliant section 23 is not a hollow body, but rather is a specially shaped sleeve that has a slot extending from one extremity to another, which defeats any premise of hollow.

The Examiner contends it would have been obvious to include Anselmo's connector 20 for connection between Matsuba's module 40 and PCB 36. This contention is traversed. The resulting structure would not work because Anselmo's solid pins of a square cross section would not mate with the pins of Matsuba's module 40 and would be unsuitable for a solder connection to Matsuba's PCB 38. Moreover, Anselmo's connector 20 does not have any

hollow body as discussed in the preceding paragraph.

The Office Action provides no motivation for one skilled in the art to use Anselmo's electrical connector in combination with module 40 and PCB 38 of Matsuba. The combination of Anselmo and Matsuba is improperly based on the hindsight of Applicants' disclosure. Such hindsight reconstruction of the art cannot be the basis of a rejection under 35 U.S.C. 103. The prior art itself must suggest that modification or provide the reason or motivation for making such modification. In re Laskowski, 871 F.2d 115, 117, 10 USPQ 2d 1397, 1398-1399 (CAFC, 1989). "The invention must be viewed not after the blueprint has been drawn by the inventor, but as it would have been perceived in the state of the art that existed at the time the invention was made." Sensonics Inc. v. Aerosonic Corp. 38 USPQ 2d 1551, 1554 (CAFC, 1996), citing Interconnect Planning Corp. v. Feil, 774 F. 2d 1132, 1138, 227 USPQ 543, 547 (CAFC, 1985).

For the reasons set forth above, it is submitted that the rejection of claim 6 under 35 U.S.C. 103(a) is obviated by the amendment and should be withdrawn.

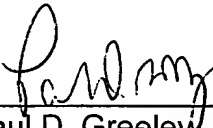
The Office Action cites a number of patents that were not applied in the rejections of the claims. These patents have been reviewed, but are believed to be inapplicable to the claims.

Newly presented claim dependent 41 recites that at least one of the voids of claim 1 is located to receive an optical signal so that the hollow body accommodates both optical and electrical signals. The cited art does not disclose or teach this feature. Newly presented dependent claim 42 recites that the plurality of voids of claim 1 are arranged in a birdcage pattern. The cited art does not disclose or teach this feature. Accordingly, it is submitted that claims 41 and 42 distinguish from the cited art and are, therefore, allowable.

It is respectfully requested for the reasons set forth above that the rejections under 35 U.S.C. 102(b) and 35 U.S.C. 103(a) be withdrawn, that claims 1, 3-6 8-10, 41 and 42 be allowed and that this application be passed to issue.

Respectfully Submitted,

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